

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2001-282219

(43)Date of publication of application : 12.10.2001

(51)Int.Cl.

subtitles

G09G 5/00  
G06F 3/00  
G09G 5/36  
H04N 1/387

(21)Application number : 2000-097398

(71)Applicant : SHARP CORP

(22)Date of filing : 31.03.2000

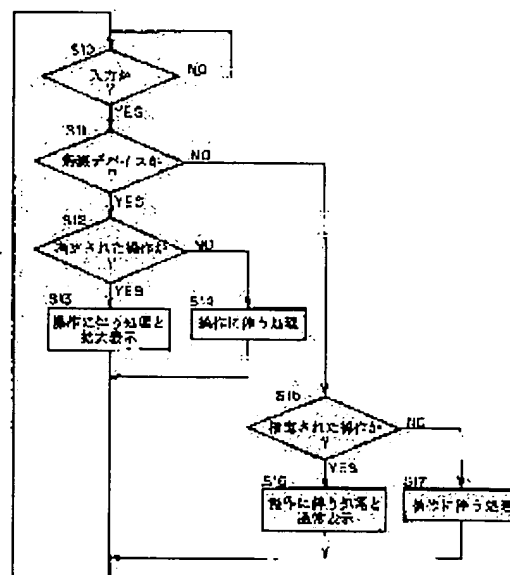
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## (54) DISPLAY CONTROLLER

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a display controller which prevents the occurrence of degradation in relative visibility caused by a range when a radio inputting device such as a remote controller is used for the inputting device of an information processor.

**SOLUTION:** The display controller discriminates whether an inputting device such as a keyboard, a mouse and a remote controller are connected with wires or radio waves (S11). When an input from an inputting device that is connected with radio waves is detected, it is judged whether the input is an operation associated with an expanded display or not (S12). When the operation is associated with an expanded display, the process associated with the operation is executed and processes which expand the image of a cursor and a window are executed (S13). When an input from an inputting device which is connected with wires is detected, a normal image is displayed (S15, S16 and S17). Thus a normal display and an expanded display are switched in accordance with the kind of the inputting device.



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**CLAIMS**

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[Claim(s)]

[Claim 1] In the display control of the information processor which performs processing based on the input from an input device, and displays images, such as a processing result, on an indicating equipment An input unit discernment means to identify the equipment to which said input unit was connected by the equipment connected with the cable, or wireless, The display control characterized by having the image amplification processing means which carries out amplification processing of said image if it is identified that it is a thing from the input unit to which the input was connected by this input unit discernment means by said wireless.

[Claim 2] In the display control of the information processor which performs processing based on the input from an input device, and displays images, such as a processing result, on an indicating equipment An input unit discernment means to identify the equipment to which said input unit was connected by the equipment connected with the cable, or wireless, The display control characterized by having the image emphasis means which carries out emphasis processing of this image by changing the magnitude of said image, a configuration, a color tone, lightness, etc. if it is identified that it is a thing from the input unit to which the input was connected by this input unit discernment means by said wireless.

[Claim 3] The display control carry out having an input device-identification means identify whether it is the input device with which said input device is set as the object of an enlarged display in the display control of the information processor which performs processing based on the input from an input device, and displays images, such as a processing result, on an indicating equipment, and the image amplification processing means which will carry out the amplification processing of said image if it is identified that it is a thing from the input device from which an input is set as the object of said enlarged display with this input device-identification means as the description.

[Claim 4] In the display control of the information processor which performs processing based on the input from an input device, and displays images, such as a processing result, on an indicating equipment An input unit discernment means to identify whether it is the input unit with which said input unit is set as the object of highlighting, The display control characterized by having the image emphasis means which carries out emphasis processing of this image by changing the magnitude of said image, a configuration, a color tone, lightness, etc. if it is identified that it is a thing from the input unit from which an input is set as the object of said highlighting with this input unit discernment means.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] About the display control in information treatment equipments, such as a personal computer, in more detail, this invention embraces the class of input unit and relates to the display control which expands, contracts or emphasizes and displays cursor, a window, etc.

[0002]

[Description of the Prior Art] Generally, in information processors, such as a personal computer, the mouse used for the keyboard used for an alphabetic character input etc., location directions, etc. is used as an input unit. These input devices are connected with the main frame with a cable through a cable in many cases. However, if the equipment linked to the main frame with which a cable will spoil the operability of an input device if an input device and the main frame are connected with a cable and to which the operating range of an input device is restricted with the die length of a cable increases in number, the problem that wiring becomes complicated will occur. In order to solve these problems, the wireless keyboard and wireless mouse which use the main frame, light, or an electric wave, and connect an input device on radio were developed.

[0003] Using television for the indicating equipment of a personal computer recently etc. may share the indicating equipment of a personal computer and television, and, as for a wireless input unit, in such a case, is convenient. Moreover, there are some by which the television function was built in the personal computer, and conventionally, since it is most to operate it with remote control, the case of television where a wireless input unit is used for a personal computer is increasing so that a personal computer can be operated like remote control. For example, the keyboard remote control which unified and wireless-ized remote control functions, such as television, and the keyboard of a personal computer and the function of a mouse is proposed by JP,10-124222,A. If such an input unit is used, it is possible to operate a personal computer from the location distant from the main frame.

[0004]

[Problem(s) to be Solved by the Invention] If it works by the main frame side when using the input unit of wireless, such as a wireless mouse, for the input unit of information processors, such as a personal computer, it can be operated like the input unit of a cable. Moreover, as it was one division-like [ wireless-izing ], operability improves by a cable being lost. However, when using an input device like keyboard remote control of JP,10-124222,A, it is possible to operate it from the location distant from the main frame to some extent like [ when operating TV remote control ]. Thus, when separating and operating it from the main frame, the cursor of a pointing device becomes small relatively and it will be hard coming to be visible. Moreover, the whole display information, such as not only cursor but text, will be hard coming it small to look. The object of this invention is to offer display controls which do not spoil visibility and operability, such as cursor and a window, to lowering of the relative visibility by the distance when operating it using the input unit connected on radio.

[0005]

[Means for Solving the Problem] The display control of this invention is for attaining the object

mentioned above. The 1st technical means In the display control of the information processor which performs processing based on the input from an input device, and displays images, such as a processing result, on an indicating equipment An input unit discernment means to identify the equipment to which said input unit was connected by the equipment connected with the cable, or wireless, If it is identified that it is a thing from the input unit to which the input was connected by this input unit discernment means by said wireless, it will be characterized by having the image amplification processing means which carries out amplification processing of said image.

[0006] In the display control of the information processor which the 2nd technical means performs processing based on the input from an input device, and displays images, such as a processing result, on an indicating equipment An input unit discernment means to identify the equipment to which said input unit was connected by the equipment connected with the cable, or wireless, If it is identified that it is a thing from the input unit to which the input was connected by this input unit discernment means by said wireless, it will be characterized by having the image emphasis means which carries out emphasis processing of this image by changing the magnitude of said image, a configuration, a color tone, lightness, etc.

[0007] In the display control of the information processor which the 3rd technical means performs processing based on the input from an input device, and displays images, such as a processing result, on an indicating equipment An input unit discernment means to identify whether it is the input unit with which said input unit is set as the object of an enlarged display, If it is identified that it is a thing from the input unit from which an input is set as the object of said enlarged display with this input unit discernment means, it will be characterized by having the image amplification processing means which carries out amplification processing of said image.

[0008] In the display control of the information processor which the 4th technical means performs processing based on the input from an input device, and displays images, such as a processing result, on an indicating equipment An input unit discernment means to identify whether it is the input unit with which said input unit is set as the object of highlighting, If it is identified that it is a thing from the input unit from which an input is set as the object of said highlighting with this input unit discernment means, it will be characterized by having the image emphasis means which carries out emphasis processing of this image by changing the magnitude of said image, a configuration, a color tone, lightness, etc.

[0009]

[Embodiment of the Invention] Hereafter, it explains based on the example which shows the gestalt of operation of this invention to drawing 1 - drawing 7 .

(The 1st example) Drawing 1 is the block diagram showing the outline of the configuration of the display control which is the 1st example of this invention. The display control of an information processor is constituted by the mouse 1 connected with the cable, the keyboard 2 connected with the cable, the remote control 3 connected by the wireless which has a function as a pointing device, the control unit 4 which performs an input control and a display control, the memory 5 for a display, and display 6 grade in drawing 1 .

[0010] Drawing 2 is a flow chart which shows the function realized by the control device 4 of the display control which is the 1st example of this invention. Generally a control unit 4 consists of a CPU, and it has an interface with an input unit, and if there is an input signal, processing accompanying it will be performed. Hereafter, with reference to the flow chart of drawing 2 , the function realized by the control unit 4 is explained. First, a control unit 4 will be detected, if the signal from an input unit is supervised and there is an input (step 10). Here, a control device 4 has the function to identify an input device, and functions as an input device identification means to identify whether an input is a thing from a mouse 1, a keyboard 2, and which input device of remote control 3. If an input is a mouse 1 or a thing from a keyboard 2, an input unit will be recognized as a cable input unit, and if it is a thing from remote control 3, it will be recognized as a wireless input unit (step 11).

[0011] In step 11, when an input is detected and an input unit is judged to be a wireless input unit, it judges whether it is what is depended on actuation in which the input was specified (step 12). The specified actuation here is actuation accompanied by an enlarged display. If it is an input by the

specified actuation, a control device 4 will perform processing to which the image which performs processing accompanying the actuation, and is continuously displayed by the processing is expanded. Thus, a control device 4 functions also as an image amplification processing means. The image data by which amplification processing was carried out is written in the memory 5 for a display by the control unit 4. The memory 5 for a display stores the pixel data which constitute the screen of an indicating equipment 6, and the image which was written in the memory 5 for a display and by which amplification processing was carried out is displayed on an indicating equipment 6 (step 13). In step 12, if it is not an input by the specified actuation, a control unit 4 will perform processing accompanying the actuation (step 14).

[0012] In step 11, when an input is detected and an input unit is judged to be a cable input unit, it judges whether it is what is depended on actuation in which the input was specified (step 15). If it is an input by the specified actuation, a control device 4 will perform processing accompanying the actuation, the image data of the usual magnitude will be written in the memory 5 for a display, and the image will be displayed on an indicating equipment 6 (step 16). If it is not an input by the specified actuation, a control unit 4 will perform processing accompanying the actuation (step 17). As mentioned above, lowering of the relative visibility by the distance in the actuation using the input unit connected on radio is canceled by usually changing a display and an enlarged display by identifying that to which the input unit was connected with the cable, or the thing connected by wireless.

[0013] Furthermore, a control unit 4 can also usually change a display and an enlarged display for every input unit instead of usually changing a display and an enlarged display in distinction from a cable input unit and a wireless input unit, since it has the function to identify an input unit. In this case, what is necessary is just to judge the input unit accompanied by an enlarged display, or an input unit without an enlarged display instead of judging a wireless input unit or a cable input unit in step 11.

[0014] For example, the mouse shall be connected on radio. Furthermore, the mouse shall be specified as an input unit without an enlarged display. Although it judges whether it is an input unit accompanied by an enlarged display at step 11 when there is actuation by the mouse, a mouse will be judged to be an input unit without an enlarged display, it will progress to step 15, and an enlarged display is not carried out. An enlarged display will be performed if it is the actuation which was judged to be an input unit accompanied by amplification processing, and was specified at step 11 when it was actuation with remote control 3. As mentioned above, an unprepared enlarged display is avoidable that an input unit identifies the thing accompanied by an enlarged display, or the thing by which it is not accompanied by usually displaying in the input unit connected by the wireless used by the main frame side by usually changing a display and an enlarged display.

[0015] Moreover, in step 13, although image amplification processing which carries out the enlarged display of the usual display of an image was performed, it replaces with image amplification processing and image emphasis processing in which an image is emphasized can be performed by changing the magnitude of an image, a configuration, a color tone, lightness, etc. In this case, if the specified actuation at step 12 is actuation accompanied by image emphasis and is an input by the specified actuation, in step 13, a control unit 4 will perform processing accompanying that actuation, and will perform processing which emphasizes the image displayed by that processing.

[0016] (The 2nd example) Drawing 3 is a flow chart which shows the function realized by the control device 4 of the display control which is the 2nd example of this invention. The following map applications are assumed in the 2nd example of this invention. Drawing 4 R> 4 is drawing showing the display screen at the time of usually displaying a map by display in map application, and drawing 5 - drawing 7 are drawings showing the display screen at the time of changing and displaying the display screen shown in drawing 4 with a pointing device. It is the system which the map is displayed on the display screen 7 of an indicating equipment 6, and displays the information on objects (a route, building, etc.) that cursor 8 displays or directs the information near the coordinate of cursor 8 location (an address, store information on neighboring, etc.) to a pop up window 9 as shown in drawing 6 if click actuation of the pointing device is carried out on a pop up window 9.

[0017] In this system, with a wireless pointing device, if cursor advance actuation is performed, as

shown in drawing 5 R> 5, the cursor 8 of a pointing device will be expanded, and amplification cursor 8a will be displayed. If carbon button click actuation is performed on a map, the information on the point which the cursor location of a pointing device directs will be displayed on a pop up window 9, as shown in drawing 6 , but at this time, amplification processing is carried out and pop up window 9a is displayed, as shown in drawing 7 . If carbon button click actuation is performed on pop up window 9a which displayed map information, this information window 9a will be eliminated.

[0018] With the cable pointing device of a mouse 1 and keyboard 2 grade, if cursor advance actuation is performed, the cursor 8 of a pointing device will be displayed in the usual magnitude. If carbon button click actuation is performed on a map, the information on the point which the cursor location of a pointing device directs will be displayed on a pop up window 9. If carbon button click actuation is performed on the pop up window 9 which displayed map information, this information window 9 will be eliminated.

[0019] Drawing 3 is a flow chart which shows the function realized by the control device 4, when the display control of the 2nd example of this invention is applied to this application. First, if there is an input from an input unit, it will detect (step 20). Then, what the input depends on a wireless device, or the thing to depend on a cable device is identified (step 21). When the input from a wireless device is detected, the input judges whether it is cursor advance actuation of a pointing device (step 22). If it is cursor advance actuation of a pointing device, cursor image 8a which performed cursor advance processing, and expanded the cursor image at that time, and was expanded as shown in drawing 5 will be displayed (step 23).

[0020] In step 22, if it is not cursor advance actuation of a pointing device, the input will judge whether it is carbon button click actuation on a map (step 24). If it is carbon button click actuation on a map, pop up window 9a by which carried out processing which reads from a database the information on the point which a cursor location directs, and amplification processing was carried out as shown in drawing 7 will be displayed (step 25). If it is not carbon button click actuation on a map, the input will judge whether it is carbon button click actuation on an information pop up window (step 26). If it is carbon button click actuation on an information pop up window, processing which closes the pop up window will be performed (step 27).

[0021] In step 21, when the input from a cable device is detected, the input judges whether it is cursor advance actuation of a pointing device (step 28). If it is cursor advance actuation of a pointing device, cursor advance processing will be performed, and as shown in drawing 4 , the cursor image of the usual magnitude will be displayed (step 29). If it is not cursor advance actuation of a pointing device, the input will judge whether it is carbon button click actuation on a map (step 30). If it is carbon button click actuation on a map, processing which reads from a database the information on the point which a cursor location directs will be carried out, and as shown in drawing 6 , the pop up window 9 of the usual magnitude will be displayed (step 31). If it is not carbon button click actuation on a map, the input will judge whether it is carbon button click actuation on an information pop up window (step 32). If it is carbon button click actuation on an information pop up window, processing which closes the pop up window will be performed (step 33). By the above procedure, the change of the usual display by discernment of an input unit and an enlarged display is performed in the application of this example.

[0022] In addition, in the 1st and 2nd examples of the above, the change of a display and an enlarged display could usually be performed, and by carrying out an enlarged display, the display control was performed so that the visibility of a display might not be hurt. However, it is not what was actually limited to the enlarged display in this way. For example, an enlarged display may be transposed to a reduced display. In this case, it is realizable by being what transposed the part of "amplification" indicated with the content and drawing in each above-mentioned example to "the cutback." furthermore, "amplification" -- you may "usually" make it the configuration of the three-stage of a "cutback."

[0023]

[Effect of the Invention] According to the display control of this invention, the display of the cursor of magnitude, a window, etc. which has recognized and was suitable for the recognized input unit can do the input unit with which alter operation was made, and the screen which does not hurt visibility can be

displayed. Moreover, also in the alter operation using the input unit connected on radio, the screen which does not hurt the visibility of displays, such as cursor and a window, can be displayed to lowering of the relative visibility by the distance between an input unit and the display screen increasing. Moreover, by using the input unit connected on radio, the distance of the operational input unit and the operational main frame becomes long substantially, and the operational range becomes large.

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## DESCRIPTION OF DRAWINGS

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### [Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the configuration of the display control of the example of this invention.

[Drawing 2] It is the flow chart which shows the function of the display control of the 1st example of this invention.

[Drawing 3] It is the flow chart which shows the function of the display control of the 2nd example of this invention.

[Drawing 4] It is drawing showing the cursor image usually displayed on the display screen.

[Drawing 5] It is drawing showing the cursor image by which the enlarged display was carried out on the display screen.

[Drawing 6] It is drawing showing the pop up window usually displayed on the display screen.

[Drawing 7] It is drawing showing the pop up window by which the enlarged display was carried out on the display screen.

### [Description of Notations]

1 [ -- A control unit, 5 / -- The memory for a display 6 / -- A display, 7 / -- The display screen of map application 8 / -- The cursor of the usual magnitude, 8a / -- The cursor, 9 which were expanded / -- The pop up window of the usual magnitude, 9a / -- Expanded pop up window. ] -- The mouse connected with the cable, 2 -- The keyboard connected with the cable, 3 -- The remote control connected on radio, 4

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[Translation done.]

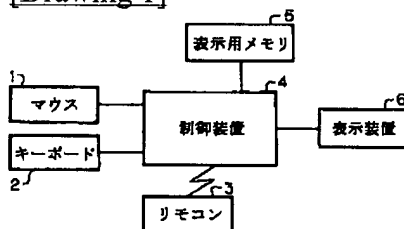
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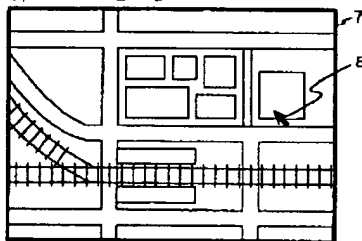
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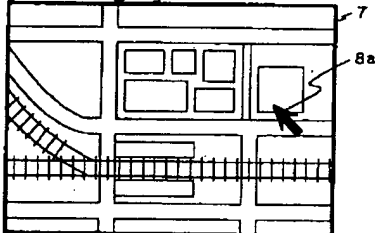
[Drawing 1]



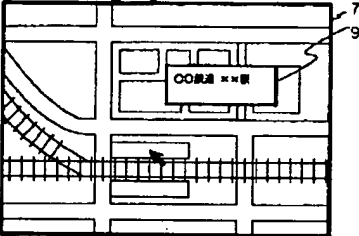
[Drawing 4]



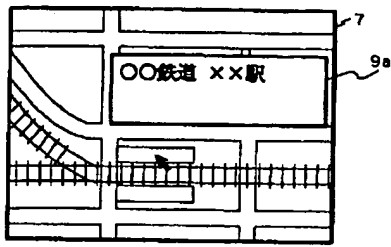
[Drawing 5]



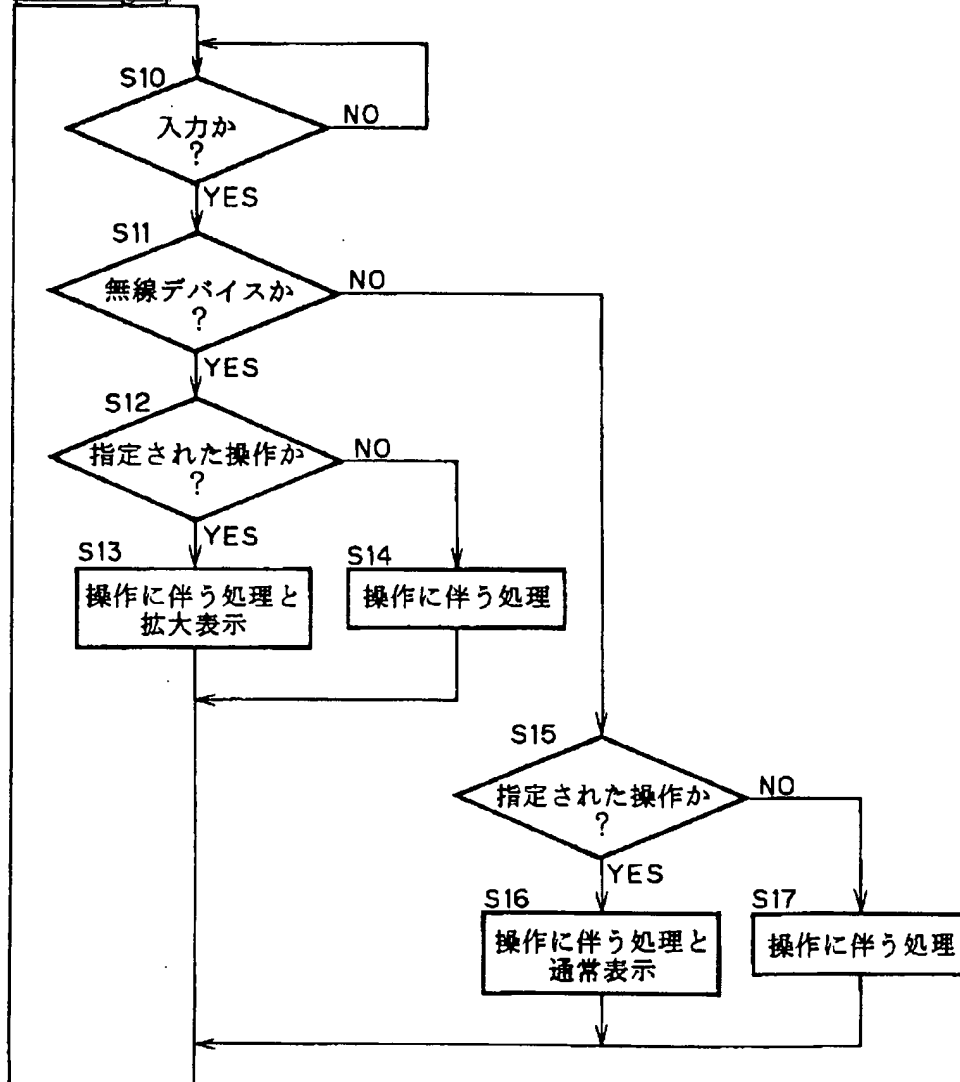
[Drawing 6]



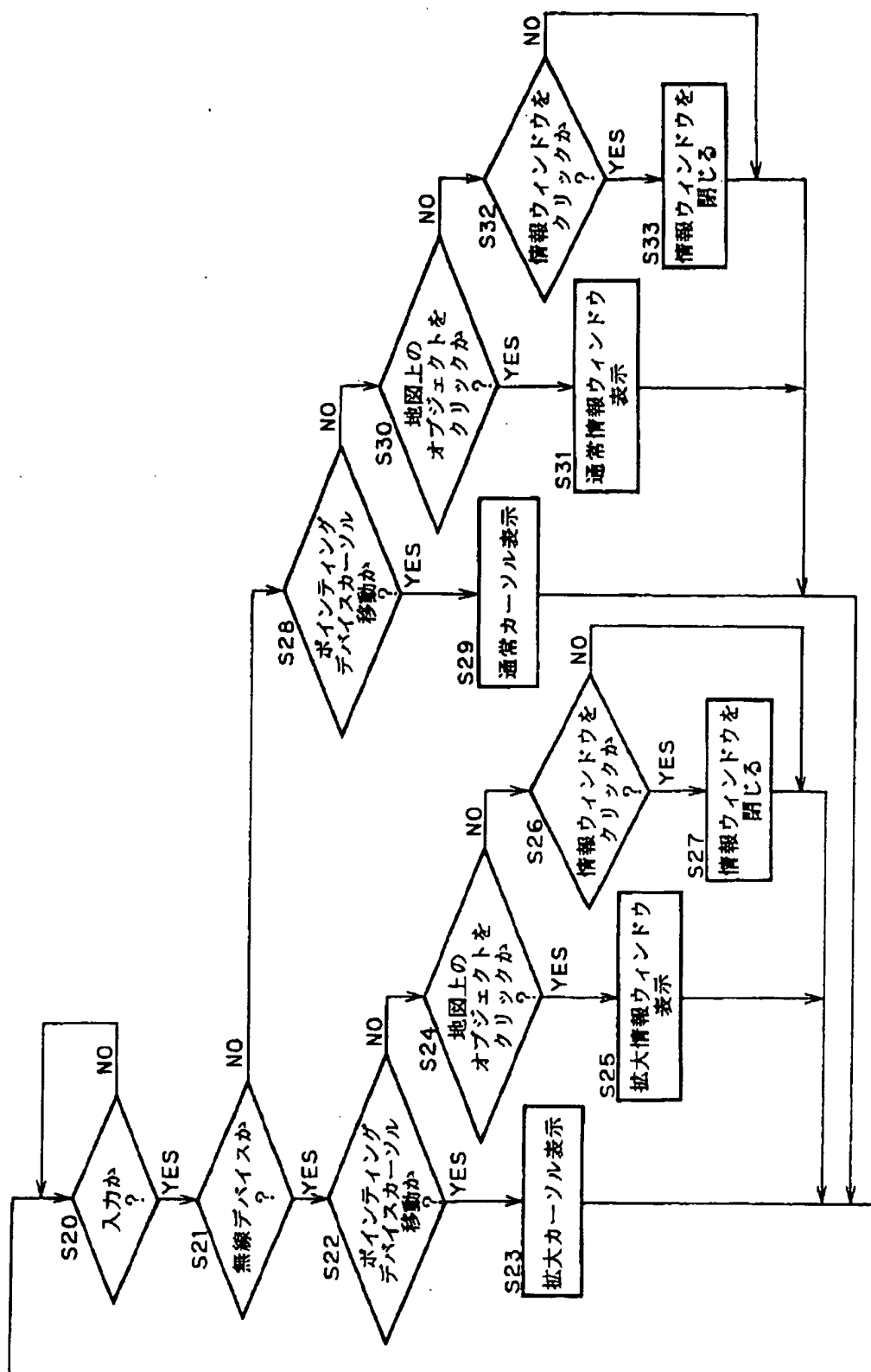
[Drawing 7]



[Drawing 2]



[Drawing 3]



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